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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/644,827 | 08/21/2003 | Takeshi Fukuda | Q76740 | 6185 |
| 23373 | 7590 | 06/29/2004 | EXAMINER | |
| SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037 | | | LEPISTO, RYAN A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2876 | |

DATE MAILED: 06/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AVX

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application N . 10/644,827 | Applicant(s) FUKUDA ET AL. | |
| | Examiner Ryan Lepisto | Art Unit 2893 2876 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: -- Method For Forming an Optical Waveguide In the Interior Of Pure Silica Glass --.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1-11** are rejected under 35 U.S.C. 102(b) as being anticipated by **Miura et al.** **Miura** discloses an optical device that forms an optical waveguide in the interior of any kind of glass having high transparency (column 2, line 7), like silica glass. **Miura** discloses the method of forming this optical waveguide in the interior of glass as focusing a pulsed laser beam, having at least a 10KHz repetition rate (column 2, lines 42-42) on the glass to form a refractive index region (column 2, lines 7-10). The diameter of the optical waveguide is controllable by the power of the pulsed laser beam at the focal point (column 3, lines 66-68), which is controllable by the pulse width of the laser beam (column 3, lines 19-20), therefore being controlled by varying either the power or pulse width or both as stated in independent **claims 1, 4 and 6**.

Art Unit: 2883

The following quotes chapter 2131.03 of the Manual of Patent Examining Procedures that is used to reject **claims 2-3, 5, and 7-11** as being anticipated by **Miura**:

2131.03 Anticipation of Ranges

A SPECIFIC EXAMPLE IN THE PRIOR ART WHICH IS WITHIN A
CLAIMED RANGE ANTICIPATES THE RANGE

"[W]hen, as by a recitation of ranges or otherwise, a claim covers several compositions, the claim is anticipated' if one of them is in the prior art." Titanium Metals Corp. v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (citing In re Petering, 301 F.2d 676, 682, 133 USPQ 275, 280 (CCPA 1962)) (emphasis in original) (Claims to titanium (Ti) alloy with 0.6-0.9% nickel (Ni) and 0.2-0.4% molybdenum (Mo) were held anticipated by a graph in a Russian article on Ti-Mo-Ni alloys because the graph contained an actual data point corresponding to a Ti alloy containing 0.25% Mo and 0.75% Ni and this composition was within the claimed range of compositions.).

**PRIOR ART WHICH TEACHES A RANGE WITHIN, OVERLAPPING, OR
TOUCHING THE CLAIMED RANGE ANTICIPATES IF THE PRIOR ART
RANGE DISCLOSES THE CLAIMED RANGE WITH "SUFFICIENT
SPECIFICITY"**

When the prior art discloses a range which touches, overlaps or is within the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with "sufficient

specificity to constitute an anticipation under the statute.” What constitutes a “sufficient specificity” is fact dependent. If the claims are directed to a narrow range, the reference teaches a broad range, and there is evidence of unexpected results within the claimed narrow range, depending on the other facts of the case, it may be reasonable to conclude that the narrow range is not disclosed with “sufficient specificity” to constitute an anticipation of the claims. The unexpected results may also render the claims unobvious. The question of “sufficient specificity” is similar to that of “clearly envisaging” a species from a generic teaching. See MPEP § 2131.02. A 35 U.S.C. 102 /103 combination rejection is permitted if it is unclear if the reference teaches the range with “sufficient specificity.” The examiner must, in this case, provide reasons for anticipation as well as a motivational statement regarding obviousness. Ex parte Lee 31 USPQ2d 1105 (Bd. Pat. App. & Inter. 1993) (expanded Board). For a discussion of the obviousness of ranges see MPEP § 2144.05.

3. **Miura** discloses an optical waveguide forming method comprised of a pulsed laser beam with a repetition rate higher than 10KHz, preferable 100kHz or more (column 3, lines 42-45). **Miura** also discloses examples of this optical waveguide forming method, with one comprising of a 120 femtosecond pulse duration laser beam (column 4, lines 17). This falls within the claimed limitation of less than 420 femtoseconds as claimed in dependent **claims 2 and 8** and within the claimed limitation of less than 490 femtoseconds as claimed in dependent **claim 7**.

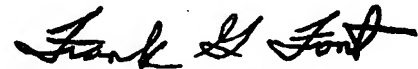
4. As stated in detailed action 3, **Miura** discloses an example optical waveguide created using a 120 femtosecond pulse duration laser beam. Dependent **claims 3 and 9** limit the pulse width range to 210-420 femtoseconds with the purpose disclosed in the specification being to control the waveguide diameter in a range of 10-14 μ m (page 8 line 45). **Miura** discloses an example that creates a waveguide with a diameter of 12 μ m with 120 femtosecond pulse width so the limiting range of dependent **claims 3 and 9** does not indicate that there is evidence of unexpected results within the claimed narrow range as required by chapter 2131.03 of the Manual of Patent Examining Procedure.
5. **Miura** also discloses an additional specification of the laser beam to have a peak power density of 10^5 W/cm² or more (column 3, lines 38-30), which lies within the claimed limiting range of less than 8.7×10^{11} W/cm² as stated in dependent **claims 5, 7 and 8**.
6. **Miura** also discloses an optical waveguide with the limitations discussed in detailed actions 1-5, which reject **claims 1-9**, so **claim 10** is anticipated by Miura by being an optical waveguide.
7. **Miura** also discloses an example an example of a optical waveguide formed by the above limitations that had a circular section, with a circle known to have an aspect ration of 1, of 12 μ m in diameter (column 4, lines 65-67), which is within the limiting range of 10-14 μ m and aspect ratio of 0.9-1.1 as stated in **claim 11**.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Lepisto whose telephone number is (571) 272-1946. The examiner can normally be reached on M-F 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RAL 6/25/04
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